



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/878,442	06/11/2001	Mrinal Kanti Das	5308-168	2584

20792 7590 04/29/2002

MYERS BIGEL SIBLEY & SAJOVEC
PO BOX 37428
RALEIGH, NC 27627

EXAMINER

JACKSON JR, JEROME

ART UNIT	PAPER NUMBER
----------	--------------

2815

DATE MAILED: 04/29/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/878,442

Applicant(s)

DAS ET AL.

Examiner

Jerome Jackson Jr.

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-56 is/are pending in the application.
- 4a) Of the above claim(s) 22-31 and 47-56 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 and 32-46 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Art Unit: 2815

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-21, are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 6,246,076. Although the conflicting claims are not identical, they are not patentably distinct from each other because applicant's claim 1 is broader than claim 1 of '076. Applicant claims a middle dielectric layer of higher dielectric constant than silicon oxide and '076 recites a silicon nitride middle dielectric layer (which has a higher dielectric constant than silicon oxide). See *In re Goodman* cited above.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1- are rejected under 35 U.S.C. 103(a) as being unpatentable over Agarwal '96 IEEE in view of Ma '93 and Kobayashi '90.

Agarwal teaches a SiC device and suggests in the conclusion that gate

Art Unit: 2815

dielectrics or alternative insulators of oxide/nitride/oxide material should be investigated

as they are expected to improve breakdown voltage. Agarwal does not specify the thicknesses of the ONO layers, however, these structures have been investigated thoroughly with silicon devices and would be expected to perform similarly with SiC devices. See Ma and Kobayashi where ONO structures are disclosed with thickness values in the range claimed. It would have been obvious to have practiced similar ONO structures in Agarwal to improve dielectric breakdown. The claimed thicknesses are shown by the applied art or are obvious design choices to one of ordinary skill. The process recitations such as "deposited" do not structurally distinguish the final product over the applied art. Patentability of a product by process claim is determined by the final product, regardless of how actually made, *In re Hira* 190 USPQ 15 at 17 (footnote 3). See also *In re Brown* 173 USPQ 685; *In re Luck* 177 USPQ 523; *In re Fessman* 180 USPQ 324; *In re Avery* 186 USPQ 161; *In re Wertheim* 191 USPQ 90; and *In re Morosi* 218 USPQ 289, all of which make it clear that it is patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above caselaw makes clear..

Functional language in the claims (to provide a ...) likewise does not structurally distinguish over the applied art which can function in the same manner. See *In re Swinehart* 169 USPQ 226.

Claims 2-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smirtic '316 in view of Slater '485, Kosa '564, Ma, and Kobayashi.

Smirtic teaches a MIM capacitor with metal electrodes which may be titanium or gold. The dielectric may be oxide, nitride, or combinations, etc. The capacitor is on a semiconductor material and the metal layers allow a very smooth and thin dielectric layer for high capacitance and reliability. Slater teaches a MOS device in SiC material for improved breakdown voltages and higher temperature operation. Combinations of capacitors with CMOS devices are useful to form memory devices as shown in Kosa. Therefore it would have been obvious to have practiced SiC CMOS and capacitors from the applied prior art to form useful memory devices with high breakdown voltages. Note

Art Unit: 2815

also that triple layer dielectrics (ONO) are obvious from Kosa. The required thickness of dielectric layers is obvious from Ma and Kobayashi. Claims 2-12 are accordingly obvious. Claims 13-21 are also obvious because the prior art applied shows interconnect metalization and the capacitor structures would be disposed on a layer of oxide on the substrate with overlying dielectric layers.

Claims 32 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Lipkin '730.

Lipkin teaches a SiC substrate with an oxynitride layer disposed over it. The introduction teaches the MOS structures with SiC material. Accordingly, capacitor structures on SiC with oxynitride dielectric are prima facie obvious. Claim 32 is rejected.

Claims 33-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lipkin '730 in view of Smirtic, Slater, Kosa, Ma and Kobayashi.

MIM capacitors on SiC material with oxynitride capacitor dielectric are obvious from the suggestions of the applied art. See Lipkin as above and further in view of Smirtic as above where metal/insulator/metal is practiced for greater smoothness, higher capacity, lower resistance, etc. Slater, Kosa, Ma, and Kobayashi are applied as above for their suggestions of SiC material benefits, ONO thicknesses, etc. Applicant's claims are obvious structure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jerome Jackson Jr. whose telephone number is 703 308 4937. The examiner can normally be reached on t-th 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lee can be reached on 703 308 4915. The fax phone numbers for the organization where this application or proceeding is assigned are 703 308 7722 for regular communications and 703 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

jj
April 24, 2002



Jerome Jackson, Jr.
Primary Examiner